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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,934	09/29/2003	Fred Gehrung Gustavson	YOR920030331US1	8288

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EXAMINER	
DO, CHAT C	
ART UNIT	**PAPER NUMBER**
2193	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/18/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/671,934	GUSTAVSON ET AL.	
	Examiner	Art Unit	
	Chat C. Do	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *9/29/03; 12/30/03; 9/11/06; and 11/21/06*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/30/3;9/11/6;11/21/6*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

The applicant is advised to update information cited in the "Cross-Reference to Related Applications" section.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-20 cite a method for providing streaming data to a processor for processing. In order for a claimed invention that is directed to such a computer implemented method of calculation, or an apparatus that is no more than a general computer implementing the method of calculation to be statutory, the claimed invention must accomplish a practical application or include a concrete, useful, and tangible result. That is the claimed invention must transform an article or physical object to a different state or thing, or produce a useful, concrete and tangible result. State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02. Also see "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility", OG Notices: 22 November 2005.

However, claims 1-20 merely disclose steps of streaming data from cache without regarding to any particular practical application or a tangible result. In addition, claims 14-18 are directed to signal medium, which are clearly not statutory. Therefore, claims 1-20 are directed to non-statutory subject matter.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1-5, 9, and 14-15 are rejected under 35 U.S.C. 102(a) as being anticipated by Garg (U.S. 6,601,080).

Re claim 1, Garg discloses in Figures 4-10 a method of executing a linear algebra subroutine on a computer having at least one cache (e.g. abstract and col. 3 lines 20-30), method comprising: streaming data for matrices involved in processing linear algebra subroutine such that data is processed using data for a first matrix residing in cache as one of an entirety of first matrix and a submatrix of first matrix and data from a second matrix and a third matrix is respectively residing as one of its entirety and submatrices thereof in a memory device at a higher level than cache (e.g. col. 3 lines 20-30 wherein the matrix is reformed to fit into the cache for efficiently processed by the processor), streaming providing data from higher level as data is required for processing (e.g. col. 7 lines 38-55).

Re claim 2, Garg further discloses in Figures 4-10 at least one cache comprises an L1 cache and higher level comprises an L2 cache (e.g. col. 7 lines 38-55 wherein L1 cache is level 1 cache and L2 cache is level 2 cache).

Re claim 3, Garg further discloses in Figures 4-10 selecting matrix stored in cache by determining which matrix will fit into cache (e.g. col. 7 lines 37-55 and col. 12 lines 17-39).

Re claim 4, Garg further discloses in Figures 4-10 determining a size of each of first matrix, second matrix, and third matrix; determining which of first matrix, second matrix, and third matrix will fit into a size of cache; and loading data for a selected one of first matrix, second matrix, and third matrix into cache (e.g. wherein the first matrix is the square portion of the source supernode, second matrix is lower triangular matrix of the source supernode, and the third matrix is upper triangular matrix of the source supernode in Figure 4).

Re claim 5, Garg further discloses in Figures 4-10 selecting a linear algebra subroutine from a plurality of subroutines to perform a matrix operation, selecting based on which of plurality of subroutine has a format consistent with matrix stored in cache (e.g. col. 3 lines 1-14).

Re claim 9, it is an apparatus claim of claim 1. Thus, claim 9 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 14, it is a signal-bearing medium claim of claim 1. Thus, claim 14 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 15, it is a signal-bearing medium claim of claim 4. Thus, claim 15 is also rejected under the same rationale as cited in the rejection of rejected claim 4.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 7-8, 11-12, 16-17, and 19-20 are rejected under 35 U.S.C. 103(a) as being obvious over Garg (U.S. 6,601,080) in view of Philip et al. ("PLAPACK: Parallel Linear Algebra Package Design Overview").

Re claim 7, Garg fails to disclose in Figures 4-10 linear algebra subroutine comprises a subroutine from a LAPACK (Linear Algebra PACKage). However, Philip et al. disclose linear algebra subroutine comprises a subroutine from a LAPACK (e.g. abstract). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add linear algebra subroutine comprises a subroutine from a LAPACK as seen in Philip et al.' invention into Garg et al.'s invention because it would enable to overcome the complexity of performing parallel computation (e.g. page 1 under introduction section).

Re claim 8, Garg further discloses in Figures 4-10 LAPACK subroutine comprises a BLAS Level 3 L1 cache kernel (e.g. col. 2 lines 22-35).

Re claim 11, it is an apparatus claim of claim 7. Thus, claim 10 is also rejected under the same rationale as cited in the rejection of rejected claim 7.

Re claim 12, it is an apparatus claim of claim 8. Thus, claim 12 is also rejected under the same rationale as cited in the rejection of rejected claim 8.

Re claim 16, it is a signal-bearing medium claim of claim 7. Thus, claim 16 is also rejected under the same rationale as cited in the rejection of rejected claim 7.

Re claim 17, it is a signal-bearing medium claim of claim 8. Thus, claim 17 is also rejected under the same rationale as cited in the rejection of rejected claim 8.

Re claim 19, Garg discloses in Figures 4-10 a method of providing a service involving at least one of solving and applying a scientific/engineering problem (e.g. col. 1 lines 10-18 for solving linear algebraic equations), method comprising at least one of: using a linear algebra software package that performs one or more matrix processing operations (e.g. col. 2 lines 11-34), method comprising streaming data for matrices involved in processing linear algebra subroutines such that data is processed using data for a first matrix stored in a cache as a matrix format and data from a second matrix and a third matrix is stored in a memory device at a higher level than cache (e.g. col. 3 lines 20-30 wherein the matrix is reformed to fit into the cache for efficiently processed by the processor), streaming providing data from higher level in a manner as data is required for processing (e.g. col. 7 lines 38-55); providing a consultation for solving a scientific/engineering problem using linear algebra software package (e.g. col. 1 lines 11-18). Garg fails to disclose a step of transmitting a result of linear algebra software package on at least one of a network, a signal-bearing medium containing machine-

readable data representing result, and a printed version representing result; and receiving a result of linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing result, and a printed version representing result. However, Philip et al. disclose a step of transmitting a result of linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing result, and a printed version representing result; and receiving a result of linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing result, and a printed version representing result (e.g. abstract and page 1 under the introduction section wherein the library is distributed to network processors for processing). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add a step of transmitting a result of linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing result, and a printed version representing result; and receiving a result of linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing result, and a printed version representing result as seen in Philip et al.' invention into Garg et al.'s invention because it would enable high performance parallel computing (e.g. page 1 under introduction section).

Re claim 20, it has limitations cited in claims 7-8. Thus, claim 20 is also rejected under the same rationale as cited in the rejection of rejected claims 7-8.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Patent No. 5,983,230 to Gilbert et al. disclose an order sparse accumulator and its use in efficient sparse matrix computation.

b. U.S. Patent No. 7,031,994 to Lao et al. disclose a matrix transposition in a computer system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2193

December 13, 2006